AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Original claims 1-16 and amended claims 1-32: (Cancelled)

Claim 33 (new): A method of designing a formation of vortex generators for generating turbulent eddies in a fluid stream to promote interaction between at least two types of particles in the turbulent eddies, comprising the steps of:

(i) identifying relevant characteristics of the two types of particles,

(ii) performing a Stokes Number analysis to determine the optimal characteristic eddy size to cause one type of particle to have a significantly higher slip velocity than the other type of particle, and

(iii) designing a formation to generate eddies in the fluid stream having the optimal size determined in step (ii) above.

Claim 34 (new): The method as claimed in claim 33, wherein the relevant characteristics of the two types of particles include the size and density of the particles.

Claim 35 (new): The method as claimed in claim 33, wherein the determination of the optimal characteristic eddy size involves an iteration process.

Claim 36 (new): The method as claimed in claim 33, wherein the Stokes Number for one type of particle is at least an order of magnitude greater than that of the other type of particle.

Claim 37 (new): The method as claimed in claim 36, wherein at least one of the particles has a Stokes Number in the range 10^{-2} to 10^{2}.

Claim 38 (new): The method as claimed in claim 33, wherein the optimal characteristic eddy size is one at which the difference in the Stokes Numbers of the two types of particles is maximized.

Claim 39 (new): The method as claimed in claim 33, wherein the formation is designed to comprise a plurality of vanes.

Claim 40 (new): The method as claimed in claim 33, wherein one type of particle is solid, liquid or gaseous, and the other type of particle is solid, liquid or gaseous.

Claim 41 (new): A method of promoting interaction between at least two types of particles in a fluid stream, comprising generating turbulent eddies in the fluid stream to cause interactions between the two types of particles in the turbulent eddies, wherein the eddies are of such a size and/or intensity that the two types of particles are entrained into the eddies to significantly different extents.

Claim 42 (new): The method as claimed in claim 41, wherein the eddies are of such a size and/or intensity that one type of particle is substantially fully entrained while the other type of particle is not substantially entrained, to thereby maximize relative slip and the likelihood of interactions between the two types of particles in the eddies.

Claim 43 (new): The method as claimed in claim 41, wherein the Stokes Number for one type of particle is at least an order of magnitude greater than that of the other type of particle.

Claim 44 (new): The method as claimed in claim 43, wherein the Stokes Number for at least one of the particles is in the range 10^{-2} to 10^{2}.

Claim 45 (new): The method as claimed in claim 41, wherein one type of particle is solid, liquid or gaseous, and the other type of particle is solid, liquid or gaseous.

Claim 46 (new): The method as claimed in claim 41, wherein the fluid stream is in a duct and the step of generating turbulent eddies comprises placing a plurality of vane members in spaced relationship across the duct to generate a multiplicity of eddies.

Claim 47 (new): The method as claimed in claim 46, wherein the spacing between the vane members is on the order of the width of the vane members.

Claim 48 (new): The method as claimed in claim 46, further comprising the step of placing additional rows of spaced vane members across the duct to form an array of vane members, the additional rows being spaced longitudinally along the duct.

Claim 49 (new): The method as claimed in claim 48, wherein the longitudinal spacing between the additional rows is on the order of 1 to 3 times the width of the vane members.

Claim 50 (new): The method as claimed in claim 46, wherein there are sufficient additional rows of spaced vane members spaced longitudinally along the duct such that the time taken for the fluid stream to pass the array is at least 0.1 seconds.

Claim 51 (new): An apparatus for promoting interaction between at least two types of particles in a fluid stream, comprising means for generating turbulent eddies in the fluid stream to cause interactions between the two types of particles in the turbulent eddies, wherein the eddies are of such a size and/or intensity that the two types of particles are entrained into the eddies to significantly different extents.

Claim 52 (new): The apparatus as claimed in claim 51, wherein the eddies are of such a size and/or intensity that one type of particle is substantially fully entrained while the other type of particle is not substantially entrained, to thereby maximize relative slip and the likelihood of interactions between the two types of particles in the eddies.

Claim 53 (new): The apparatus as claimed in claim 51, wherein the Stokes Number for one type of particle is at least an order of magnitude greater than that of the other type of particle.

Claim 54 (new): The apparatus as claimed in claim 53, wherein the Stokes Number for at least one of the particles is in the range 10^{-2} to 10^{2}.

Claim 55 (new): The apparatus as claimed in claim 51, wherein one type of particle is solid, liquid or gaseous, and the other type of particle is solid, liquid or gaseous.

Claim 56 (new): The apparatus as claimed in claim 51, wherein the fluid stream is in a duct and the means for generating turbulent eddies comprises a plurality of vane members in spaced relationship across the duct to generate a multiplicity of eddies.

Claim 57 (new): The apparatus as claimed in claim 56, wherein the spacing between the vane members is on the order of the width of the vane members.

Claim 58 (new): The apparatus as claimed in claim 56, further comprising additional rows of spaced vane members across the duct to form an array of vane members, the additional rows being spaced longitudinally along the duct.

Claim 59 (new): The apparatus as claimed in claim 58, wherein the longitudinal spacing between the additional rows is on the order of 1 to 3 times the width of the vane members.

Claim 60 (new): The apparatus as claimed in claim 56, wherein each vane member is of Z-shaped cross-section.

Claim 61 (new): The apparatus as claimed in claim 60, wherein each vane member has spaced tooth portions along its longitudinal edges.

Claim 62 (new): An apparatus for causing interaction between large particles and fine particles in a fluid stream, comprising an array of micro-vortex generating formations for generating a multiplicity of micro-vortices across the fluid stream, the array including a plurality of longitudinally spaced rows of micro-vortex generating formations, each row having a plurality of transversely spaced micro-vortex generating formations, and wherein the fine particles are substantially entrained in the micro-vortices while the large particles are not substantially entrained, to thereby maximize relative slip and the likelihood of interactions between the two types of particles.

Claim 63 (new): The apparatus as claimed in claim 62, each micro-vortex generating formation is a vane member of Z-shaped cross-section with scalloped longitudinal edges.